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            IN THE UNITED STATES DISTRICT COURT FOR THE
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                   NORTHERN DISTRICT OF OKLAHOMA
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4
     W. A. DREW EDMONDSON, in his )
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     capacity as ATTORNEY GENERAL )
     OF THE STATE OF OKLAHOMA and )
6
     OKLAHOMA SECRETARY OF THE
     ENVIRONMENT C. MILES TOLBERT,)
7
     in his capacity as the
     TRUSTEE FOR NATURAL RESOURCES)
8
     FOR THE STATE OF OKLAHOMA,
9
                  Plaintiff,
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                                    )4:05-CV-00329-TCK-SAJ
     VS.
11
     TYSON FOODS, INC., et al,
12
                  Defendants.
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14
                       THE VIDEOTAPED DEPOSITION OF
15
     VALERIE HARDWOOD, PhD, produced as a witness on
16
     behalf of the Defendants in the above styled and
17
     numbered cause, taken on the 18th day of July, 2008,
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     in the City of Tulsa, County of Tulsa, State of
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     Oklahoma, before me, Lisa A. Steinmeyer, a Certified
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     Shorthand Reporter, duly certified under and by
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     virtue of the laws of the State of Oklahoma.
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TULSA FREELANCE REPORTERS 918-587-2878

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1	A	Of course, I've done some additional data		
2		rsis for the report.		
3	Q	Right, and you submitted a report?		
4	Q A	Correct.		
5		We talked at your last deposition you	09:09AM	
	Q		09:09mn	
6		d at your last deposition a bit about fate and		
7	trans	port, and let me just run through some		
8	chara	cteristics here, and I hope we can take care of		
9	these	pretty quickly. Since your prior deposition,		
10	have	you conducted any study of the fate and	09:09AM	
11	trans	port characteristics of any bacterium in the		
12	Illin	ois River watershed?		
13	A	No, I have not.	1	
14	Q	So you have not studied how bacteria is		
15	affec	affected by temperature? 09:09AM		
16	A	No.		
17	Q	Desiccation?		
18	A	No.		
19	Q	Predation?		
20	A	No.	09:09AM	
21	Q	Osmotic pressure?		
22	A	No.		
23	Q	UV exposure?		
24	A	No.		
25	Q	pH balance?	09:09AM	
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1	contamination.			
2	Q Okay, but in order for it to be an indicator			
3	of poultry fecal contamination, is it necessary that			
4	the PCR sequence share the same fate and transport			
5	as pathogens from poultry litter?	02:00PM		
6	A Can you say that again? I just got to get the			
7	first part.			
8	Q Sure. In order for it to be an indicator			
9	you've just said it is an			
10	A Indicator of poultry fecal contamination.	02:00PM		
11	Q Right, and that fecal contamination you are			
12	talking about here is bacteria; correct?			
13	A Correct.			
14	Q Okay. So in order for the presence of the			
15	indicator 02:00PM			
16	A I'm sorry. Let me go back there because we're			
17	not only concerned about bacterial fecal			
18	contamination from poultry, we're also concerned			
19	about nutrient contamination. So we can add			
20	nutrients and metals to that list.	02:00PM		
21	Q We'll talk about let's table the nutrients			
22	and the metals for just a second and let's talk			
23	about bacteria. In order for it to indicate the			
24	presence of bacteria derived from poultry, is it			
25	necessary that the PCR that the Brevibacterium	02:00PM		

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1	that you identified share the fate and transport			
2	characteristics of other bacteria from poultry			
3	litter?			
4	A It would have to have certain fate and			
5	transport characteristics in common.	02:01PM		
6	Q Okay. If we compare the correlations that we			
7	discussed here, so the correlation, let's say,			
8	taking Enterococcus, for instance, the relationship			
9	between Enterococcus and the sequence in litter as			
10	.75 and the relationship between Enterococcus and	02:01PM		
11	the biomarker the sequence in water is .89, which			
12	is different; correct?			
13	A It's different, but it's certainly within the			
14	bounds of what you would expect from regular			
15	sampling error.	02:01PM		
16	Q Okay. How big a difference can you have			
17	within the bounds of regular sampling error?			
18	A In environmental microbiology we're very happy			
19	to get correlations of .3 as long as they're			
20	statistically significant, even .2 sometimes. So	02:01PM		
21	there's a really wide range of what you can get from			
22	correlations and still be biologically meaningful.			
23	Q Okay. So does it surprise you at all then			
24	that the correlation that you got between E. coli			
25	and the PCR sequence in litter was .39 you told me	02:02PM		

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